

Daily GLOWBUGS

Digest: V1 #50

via AB4EL Web Digests @ SunSITE

Purpose: building and operating vacuum tube-based QRP rigs

[AB4EL Ham Radio Homepage @ SunSITE](#)

%%%% GlowBugs %%%% GlowBugs %%%% GlowBugs %%%% GlowBugs %%%%

Subject: glowbugs V1 #50

glowbugs

Tuesday, June 3 1997

Volume 01 : Number 050

Date: Mon, 2 Jun 1997 21:28:47 -0500 (EST)

From: "Roberta J. Barmore" <rbarmore@indy.net>

Subject: FISTS Members?

Hi!

Quick note--any FISTS members on the list who'd care to be listed as my "sponsor?" (No, *I* write the check). Just about to send in the app.

73,
--Bobbi

Date: Mon, 2 Jun 1997 21:29:45 +0000

From: "Robert Nickels" <ranickel@mwci.net>

Subject: Cheap HV caps

Hi all,

I keep reading about the high voltage capacitors inside the "throw-away" cameras. The issue of Nuts and Volts picked up at last hamfest had an article about a tube conversion of SS Dynaco stereo amp (!) which used them in the p/s. Also interesting choice of tubes, if you're into audio...

Anyone have any luck begging the old camera bodies from friendly local photo shop?

73, Bob W9RAN

Date: Mon, 2 Jun 1997 20:13:58 -0700 (PDT)

From: John Kolb <jlkolb@cts.com>

Subject: Re: High voltage in a PC power supply (was: Re: Electrolytic caps. needed...)

On Mon, 2 Jun 1997, Jeff Duntemann wrote:

> Good grief! What the heck is high voltage DC doing inside a PC power
> supply!?!?!?!?
>
> (And the corrolary question: Could selfsame DC be harnessed for glowug
> purposes?)
>

1. The 110 V AC from the power plug is rectified and filtered to provide 110 V DC to the input to the switching regulator, which then converts it to 50 - 100 kHz before it goes through a transformer to become +/- 5 and 12 V DC. This allows the use of very small ferrite core transformers, instead of the large hunk of iron it would take to provide 15A or more of +5V from a 60 Hz transformer.

2. ABSOLUTELY NOT. THE 110 V DC IS NOT ISOLATED FROM THE POWER LINE!!!
(Yes I was shouting)

John Kolb KK6IL

Date: Mon, 2 Jun 1997 21:49:32 -0700 (MST)
From: Chris Trask <ctrask@primenet.com>
Subject: Re: 12AX7

On Tue, 3 Jun 1997, Bill Turner wrote:

> > > > Dug out the RCA manual to see what it says about the T, U, and X7.
> > > > Data sheets dated 1954, 1960, and 1961 show the following:
> > > >
> > > > Item 12AT7 12AU7 12AX7
> > > > Max Watts 2.5 2.75 1.2
> > > > Max Avg Ma - 22 -
> > > > Max Volts 300 330 330
> > > >
> > > This is HIGHLY weird since the plates in the X7 are NEARLY 3 TIMES as
> > > large as those of the T7 ! By actual measurement of one of the plates
> > > of each tube, I get .8625 square inches of area for each plate in the
> > > 12AX7 and .375 square inches of area for each plate in the 12AT7.
> > > >
> > >
> > > OK. But something is still screwy. A tube with less then HALF the plate
> > > area of another cannot possibly provide over twice the power output, all
> > > else being equal.
> > >
> > > I suspect your last sentence holds the key.... all else is NOT equal.
> > > The 12AX7 has a much higher amplification factor than the others and
> > > to achieve this it no doubt has a finer grid structure, which would be
> > > more easily damaged by excessive heat - hence the lower plate
> > > dissipation rating.
> > >

I was able to take a peek inside both a 12AT7 and a 12AX7, and the grid structures, as far as spacing, diameter, and elipticity are concerned, are the same, the difference being that the lengths are different by almost a factor of 2.

In the Sylvania manual, the plate resistances are dramatically

I also notice that the 12AX7 is much more linear (It's the same as the triode section of a 6AV6). I might expect this along the same lines as what makes a good, linear bipolar or field-effect transistor, which is the dispersion of the electron stream over a larger area (I'm over-simplifying here). But, it will have a much larger plate-to-grid capacitance, thereby lowering the frequency response.

Chris

[illegible]

Email: ctrask@primenet.com

Date: Tue, 03 Jun 1997 09:42:04 +0200
From: Jan Axing <janax@li.icl.se>
Subject: Re: High voltage in a PC power supply (was: Re: Electrolytic caps. needed...)

BOB DUCKWORTH wrote:

> There are others but these are the ones I see most of in the dumpster.

The others are in European dumpsters. They are also switchable between 110 and 220 but runs a rectifier bridge at 220 and voltage doubler at 110. These units usually have two 200V capacitors. Newer universal units go from 90 to 260V without switching (no pun!) and have a single 400V cap.

Jan, SM5GNN

Date: Tue, 03 Jun 1997 22:22:49 +1000

From: Murray Kelly <mkelly@faraday.dialix.com.au>

Subject: Re: High voltage in a PC power supply (was: Re: Electrolytic caps. needed...)

I wonder if one could put the output (5V) into another SMPS transformer back to back, thus creating an isolation type trf? You'd need another old SMPS, of course to supply the 2nd trf.

That way you'd get the full 300V and not run the risk of fiddling with live chassis?

How about modulating the 5V, even?

> 1. The 110 V AC from the power plug is rectified and filtered to
> provide 110 V DC to the input to the switching regulator, which then
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> 2. ABSOLUTELY NOT. THE 110 V DC IS NOT ISOLATED FROM THE POWER LINE!!!
> (Yes I was shouting)
>
> John Kolb KK6IL

- --

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*****
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*      29 Molonga Ter. / Graceville/ QLD. 4075/ Australia      *
*                               ph/fax Intl+ 61 7 3379 3307      *
*****
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Date: Tue, 3 Jun 1997 08:10:08 -0600

From: mack@mails.imed.com (Ray Mack)

Subject: Re[2]: High voltage in a PC power supply (was: Re: Electroly

This is a *terrific* idea. It ought to work just fine. It would give you about 80 % conversion efficiency as well. Using the 5V feedback circuit is probably a necessity because of the way these supplies do their thing.

Ray Mack

Reply Separator

Subject: Re: High voltage in a PC power supply (was: Re: Electrolytic
Author: Murray Kelly <mkelly@faraday.dialix.com.au> at mails
Date: 6/3/97 10:22 PM

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That way you'd get the full 300V and not run the risk of fiddling with live chassis?

How about modulating the 5V, even?

Date: Tue, 3 Jun 1997 08:45:30 -0600 (MDT)
From: Art Winterbauer <art@comet.ucar.edu>
Subject: 6L6 voltage

I plan to build a 6L6 (metal tube) transmitter and have just finished a power supply, using a 340-0-340 transformer. The power supply uses the CT and the two plate leads through a pair of diodes and an RC filter to produce about 500 vdc with no load. Will this produce too much voltage for the 6L6 to handle?

- --Art wa5oes

Date: Tue, 3 Jun 1997 10:55:00 -0600
From: Alex Mendelsohn <alex@pennwell.com>
Subject: FW: Plate xfmr (Was: Electrolytic caps.)

Yup, I needed a plate xfmr for my homebrew 160 meter amplifier, and I am presently using microwave oven transformers. I started with a single transformer. It's mounted on an insulating strip, as one side of the secondary is connected to the transformer's frame. It feeds a full-wave bridge rectifier.

It was able to permit me to get 500 Watts output power from a pair of 8188s (they're pulse-rated 4-400A tetrodes; I use 'em in grounded grid).

I have since added a second microwave oven transformer with the secondaries in parallel. I am now able to get 600 W output power. I also use a variac on the ac inputs.

Since doing all of this, I'm now in possession of a widow-maker plate transformer that W2ERJ gave me. It's a real plate transformer, and I hope to hook it up before the winter DX season. However, I'll miss the nifty wiring job (looks like a xfmr sub-station down at the local power company) under the hood with the microwave jobbies.

By the way, the DC output voltage charges to the peak value of the secondary RMS value, and then drops to about 90% of the RMS value under load. In other words, the regulation isn't so hot because I'm pulling as much current as I can from the microwave oven xfmr secondaries. However, the output on my RF 'scope is really nice on CW and I get a great looking 2-tone test pattern

(and good modulation reports on the air) on SSB, so who cares?

It DOES work.

BTW: you cannot easily disassemble most uWave xfmrs. The laminations are typically welded together. That precludes rewinding these jobbies.

Vy 73, Alex, AI2Q in Kennebunk, Maine .-.-.

From: Brian Carling, Radio AF4K
To: ALEXM; 'GLOWBUGS@SMTP <glowbugs@www.atl.org>'
Subject: Plate xfmrs (Was: Electrolytic caps. nee
Date: Monday, June 02, 1997 8:28PM

Original Subject:
Plate xfmrs (Was: Electrolytic caps. needed...)

On 2 Jun 97 at 7:36, BOB DUCKWORTH spoke about Re: Electrolytic caps. needed... and said:

> Anyone ever looked into modifying the time constant of regulation
> feedback loop and using an audio signal as reference to turn one of
> these into a 150W audio amp (modulator :-)?

Now THAT sounds like fun!

On a similar topic, I wonder if ANYONE on here has tried using the old transformer out of a microwave oven as a PLATE SUPPLY for a half KW RF amplifier? I am thinking I could get enough out of one of those for many hundred volts, perhaps even 1-2000 V DC for an amplifier here.

If you say it HAS been done, my next idea is to start calling around to all of the repair places or looking in their dumpsters!

WATSAY?

I have some NICE NIB Sweep Tubes here just waiting to be built into a 500 watt final!

Bry

*** 73 from Radio AF4K/G3XLQ Gaithersburg, MD USA *
** E-mail to: bry@mnsinc.com *
*** See the interesting ham radio resources at: *
** <http://www.mnsinc.com/bry/> *

Date: Tue, 3 Jun 1997 12:15:04 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: 6L6 voltage

> I plan to build a 6L6 (metal tube) transmitter and have just finished
> a power supply, using a 340-0-340 transformer. The power supply uses
> the CT and the two plate leads through a pair of diodes and an RC
> filter to produce about 500 vdc with no load. Will this produce too
> much voltage for the 6L6 to handle?

I would expect that to be fine, once a little bleeder was added to give about 5-10ma idle bleeder current. Then it should drop down to around 400-425 volts, and that is ideal for a 6L6 puffer.

It always is advantageous to load a power supply down on a small puffer rig, to help stabilize things. I shoot for around 10ma bleeder idle current, and that works pretty well. It is mostly a matter of whatever biggie resistors you have in the junk box. If you don't have a set of resistors, then put about 7 each 4 watt nitelite bulbs in series to act as the bleeder (roughly at the rate of about 75 volts per bulb).

For the purists, a 10 ma load on a 500 volt power supply is:

$$I = E/R \text{ or } 0.010 = 500/R$$

to give a required bleeder of:

$$R = 500/0.010 = 50,000 \text{ ohms}$$

with a current rating for cold operation of 10 x dissipated power:

$$p = I \times I \times R \times 10 = 0.01 \times 0.01 \times 50,000 \times 10 = 50 \text{ watts}$$

The nitelite bulbs have a rating of 4 watts at 120 volts or a current rating of 4/120 or 0.033 amps at full brilliance. You could run 5 of the nitelites at full brilliance, but no fewer than that, and that would give a 33ma load on the bleeder. I prefer a little less brilliancy in them for longevity, and put more on accordingly.

Either way works fine. Nitelites get expensive though, if you have a bunch of sockets for them to buy, but they look neat on a breadboard set. The 50K bleeder at 50watts is a good classic approach.

Be creative, and raid the junk box!

73/ZUT DE NA4G/Bob UP

Date: Tue, 03 Jun 1997 12:14:24 -0500
From: Conard Murray <ws4s@InfoAve.Net>
Subject: Re: 6L6 voltage

Hi Art,
I have a two-stage 6V6 -> 6L6 rig that I run with a 500 volt plate supply. I used it daily for a month or so last winter on 160 and 80 and had no problems with anything getting overstressed. I was quick on the plate tuning cap though.
Actually, I did have a problem with a 6L6 ... I was testing a bunch of loose 6L6's I had and this one was gassy. It looked more like a VR tube until the grids burned out. Nice light show.
Be sure to report back on your results!
ZUT!
Conard

Date: Tue, 03 Jun 1997 11:10:28 -0700
From: Ken Lopez <kjlopez@earthlink.net>

Subject: Re: "Autotransformer modulation"

Brian Carling (Radio G3XLQ / AF4K) wrote:
scheme for a higher power - say 100-200 watt rig.

>

> Now, I have an audio amplifier that can supply 100 watts using a pair
> of 807 tubes, BUT the output tranny is no use for modulation xfmr
> because it only has "70V, 100V, and 120V LINE" outputs which seem to
> run in the range of about 50-90 ohms characteristic impedance.

To find the actual output impedance of a "constant voltage" transformer,
use the following :

$$Z = \frac{V^2}{P}$$

Where P=Power out, Z=Impedance, V=Voltage rating

For the above 100 W. amplifier, A 70V xformer is actually 50 ohms,
100V tap is 100 ohms, and 120V is 144 ohms impedance at audio
frequency, usually centered at 1000Hz.

Hope this helps.

Ken, N6TZV

Date: Tue, 3 Jun 1997 14:44:37 -0500 (CDT)

From: Dan Kerl <dlkerl@ro.com>

Subject: Re: FW: Plate xfmrs (Was: Electrolytic caps.)

> BTW: you cannot easily disassemble most uWave xfmrs. The laminations are
> typically welded together. That precludes rewinding these jobbies.

>

> Vy 73, Alex, AI2Q in Kennebunk, Maine .-.-.

Does anyone know why microwave power transformer laminations are welded
together (usually with a bead on a corner)? Is it to reduce lamination
rattling noise? Welding the laminations together in this fashion will
increase eddy current losses in the core.

I suspect that the weld bead isn't too deep and that it would be possible
to simply file or grind it off. It would probably help to re-anneal the
laminations after doing this. It takes a pretty hot oven (802 deg C
for 4 hours, as suggested by the rubber bible).

I'm interested in transformer construction as part of my hobby. I've found
that the cost of new transformers dominates the cost of a tube project,
and the supply of old stuff at the correct voltages is getting hard to
find (at least around here). Finding new materials (particularly
insulation and laminations) is a problem, however. Tearing apart old units
is the only way I've found to get this stuff, but it gets old and messy
and I'd like to have information on the magnetic material's pedigree. A
dumpster diver's hobby, for sure...

Dan Kerl
dlkerl@ro.com

Date: Tue, 3 Jun 1997 17:20:35 -0500 (EST)
From: "Roberta J. Barmore" <rbarmore@indy.net>
Subject: FISTS

Hi!

Two things, both of them mentioned here due to the amount of interest:

1. We have a winner--er, something like that; K8FC and N9NVV responded within minutes of my request for a "sponsor," were both so listed and then the application was mailed. About a *dozen* members have responded thus far; I would love to add all of you to the app. but the envelope is in the hands of the Postal Service already. Instead, I offer very sincere thanks.

2. Several folks have written, asking about the organization. Officially, it is a group devoted to the love of CW and to encouraging the use of it in positive ways; they run traffic nets, QSO parties, offer various nice awards and have regular contests; they also have a "Code Buddy" program that matches up beginners with Elmers, and several other things I've forgotten.

Unofficially and based on the number and tone of the replies I have had, it's a widespread secret society devoted to doing good--but that's just my opinion! :)

They have a webpage (which is where I found 'em, some months back), at:
<http://n9nvv.qrp.com/~fists>

...And since this is only marginally related to the topic of this list, I'll end with that.

73,
--Bobbi

Date: Tue, 3 Jun 1997 19:42:45 -0600 (MDT)
From: toyboat@freenet.edmonton.ab.ca
Subject: Re: 6L6 voltage

On Tue, 3 Jun 1997, Art Winterbauer wrote:

>
> I plan to build a 6L6 (metal tube) transmitter and have just finished
> a power supply, using a 340-0-340 transformer. The power supply uses
> the CT and the two plate leads through a pair of diodes and an RC
> filter to produce about 500 vdc with no load. Will this produce too
> much voltage for the 6L6 to handle?
>
> --Art wa5oes

Should work just fine. I recently completed a 6L6 one-tuber, using the Fred Sutter "QSL Forty" circuit, with link coupling. I used a 300-0-300 VAC trafo quite robust in size. With a bleeder resistor of 34K and a series screen resistor in the oscillator, I was getting about 390 VDC at resonance (tight coupling - 15 Watt light bulb dummy load). I used a 5Y3GT rectifier, two 40 uF filters, and 3H choke.

Even with a dinky little colorburst crystal, no problems. Good

keying, very little chirp. The crystal has survived much testing, with no signs of dreaded fracture-itis.

I removed the screen resistor and wired the screen directly to B+ (as I had seen done in another circuit). B+, key down, dropped to 355 VDC, and power output increased. Keying also seemed crisper. Again, the colorburst crystal took this in its stride.

My bottles are glass units. With room lights dim, you can see the plate get a little red on one (JAN 5881) if you hold the key down more than a few seconds.

My 300 VAC trafo is (as a guess) a 200 mA unit, which accounts for its high load DC voltage. If your trafo is a smaller unit, it will probably load down to a DC voltage close to its AC rating, key-down.

You should get excellent results at 350 VDC or even 400 VDC.

Incidentally, I'm using a close-spaced BC receiver air variable capacitor in my output tank, with B+ directly across. No problems with air dielectric breakdown. (saves using a 2.5 mH plate choke, however the tank carries lethal voltage for the unwary.)

My plate and coupling coils are basketweave Lorenz (#18 bell wire), supported on a 2" circle of 7 spaced 1/4" vertical dowels.

Best Regards,

~~~~~  
Shane Wilcox <toyboat@freenet.edmonton.ab.ca>

>  
>

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Date: Tue, 03 Jun 1997 22:52:41 -0700  
From: Glenn Finerman <glennfin@worldnet.att.net>  
Subject: re:Inexpensive generic pentodes!

Thanks for the tip Barry!

re>I recently ran across this sales notice on one of the Usenet groups. I  
>cannot say anything about the company yet, but I am ordering a lifetime supply!  
>The 6AG5 is an RF/IF sharp cutoff pentode rated to 400 MHz. Its pinout is  
>slightly different from the standard 6AU6/6BZ6/6CB6/etc. pentodes in that it has two  
>cathode pins to reduce inductance and the suppressor is internally connected to the  
>cathode. <snip>  
>At this price, I hope some of the Glowbugs folks take advantage of the  
>opportunity to experiment. I don't mind throwing away a few dimes for  
>educational purposes learning about a new circuit - and this tube should be  
>useful from audio through VHF.

You bet! I just sent an E-mail to Kevin to find about where to send the check.  
Heck!, even an unemployed glowbugger like me can afford \$20 for 200 tubes including shipping!

According to the RCA Tube handbook, the 6AG5 has a max rating of 300v on the plate triode connected at 5.5ma max plate current. What about trying something crazy like several in parallel in an output stage for a QRP rig?? or would that just be silly? The 6AG5WA is a ruggedized version right?

re>Kevin Harlan <sales@emodus.com>  
>NEW! 8,000 available. \$0.10 each  
>JAN 6186W, Equal to 6AG5WA, Sharp cut-off, pentodes, 7 pin  
>miniature, made by Philips in the USA in 1986.  
>Shipping in USA 1-199 tubes \$3.00, 200 or more shipping free.

73.....Glenn N2BJG    glennfin@worldnet.att.net

Owner/operator of the N2BJG 10 meter beacon = 28.219 Mhz.  
(24hrs a day, 7 days a week) Please QSL!!!

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End of glowbugs V1 #50  
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Created by **Steve Modena, AB4EL**  
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